

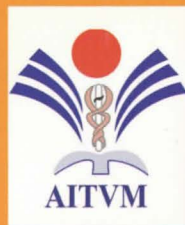
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Does control
of animal
infectious
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EPIDEMIOLOGY AND CONTROL OF AFRICAN SWINE FEVER IN SENEGAL: FROM FARM SURVEYS TO NATIONAL NETWORK.

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ABSTRACT

African Swine Fever (ASF) is considered to be enzootic since 1957 in Senegal where the population of pigs is concentrated in the catholic areas of the country (South-West). This risk assessment of the African Swine Fever (ASF) in Senegal includes economical aspects of the pig production chain. Different surveys allowed obtaining a good overview of the epidemiology and the main risk factors of introduction of ASF in the farms. Animal and money flows were estimated to identify the risk pathways at a national level. The global prevalence of the disease given by our transversal survey was 17% [14.4%-19.6%], but significant differences were recorded between regions. The Ziguinchor region showed a higher prevalence of 24.8% [20%-29.6%]. The survey in the farms showed that the main risk factors are the neighbouring ASF cases, the entrance of foreign breeders in the farm and the free-ranging of pigs. These result and the study of animal flows allowed the preparation of a communication policy in order to inform farmers and associations of breeders about the hazards of the disease and the main precautions to consider related to hygiene in farming practices. In terms of risk management, these results allowed to propose the optimization of the national surveillance network concerning ASF. This improvement will adapt the passive surveillance system with better involvement of breeders in the control of commonly devastating disease.

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INTRODUCTION

Part of a project on epidemiology of ASF, Senegal was one of the 4 investigation fields. Two main objectives of this project have been determined in Senegal during a first year of investigation. First of all, we needed to assess the real importance of the disease in Senegal. Then we wondered which was the influence of breeding system on suspicion or/and cases of ASF. This first year showed also some differences between our results and the official statistics of the disease. This is the reason why in a second step we made a large survey to assess the national epidemiologic surveillance system and then to recommend measures for its improvement.

MATERIALS AND METHODS

To investigate the risk factors linked with ASF cases, a field questionnaire survey was performed in the three main swine farming regions in Senegal. Information was collected about previous ASF outbreaks, farm typology, farm management, and biosecurity measures. In the three study areas, 397 farms were investigated using a stratified random sampling based on administrative units. A factorial analysis of correspondence was run to investigate the 28 different potential risk factors predetermined. Then we kept 7 risk factors presenting the most significant odds ratio. To determine the risk factors statistically linked with the probability of cases or suspicion, we run a logistic regression in ascending order, parameters being tested by the Wald test. The estimated prevalences given in this first part of work were confirmed by sampling animals in another random sample of farms in the same area. Sampling was made to have an absolute precision of 5% and a total of 801 sera were collected. A Blocking-Elisa test using a purified protein extract from the virus (VP73) as antigen was performed on the blood samples (kit Ingezim Das, Ingenasa, Madrid, Spain). We compared our results with the recorded information given by the national Veterinary Services. Because a large gap was noticed between our observation and the records kept and because of the enzootic pattern of the disease, a study on the pig production chain with focus on the physical and financial flows was initially carried and in a second step the current surveillance network was assessed. This last survey allowed to interview 46 veterinary services officers. These studies should provide an explanatory overview of the ASF problematic in Senegal. Information on the sylvatic cycle of the disease has also been collected and is presented in another paper (Jori *et al.*, 2007).

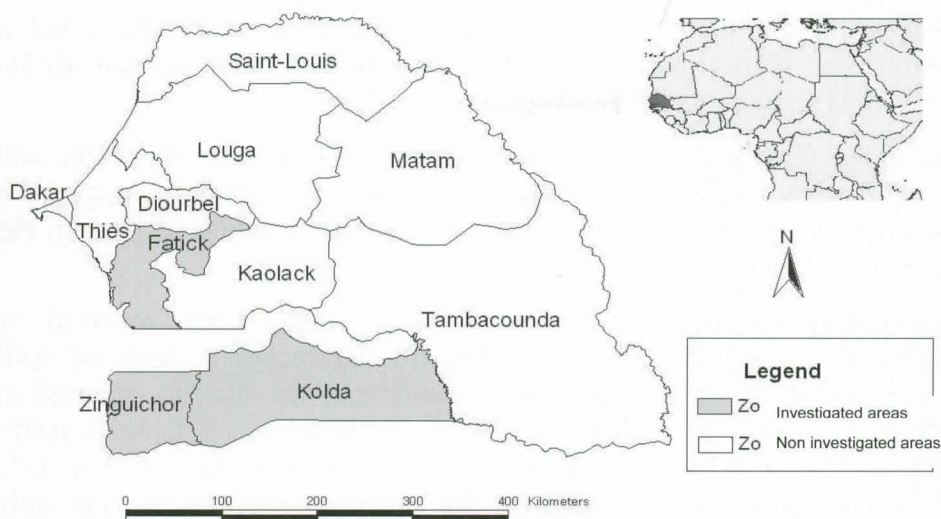


Figure 1. The three investigated regions in Senegal.

RESULTS

The survey in pig farms gives us an estimated overall farm prevalence of 58%. Statistical differences were recorded between regions with respectively 80%, 61% and 44% for the Ziguinchor, Kolda and Fatick regions. Nevertheless, the temporal scale of this prevalence is the life of the farm. To calculate the estimated annual prevalence we choosed to keep only those cases reported during the 5 last years (2001-2006) to reduce the risk of under notification. The estimated annual farm prevalence is respectively 10.4%, 9.9% and 7% for the Ziguinchor, Kolda and Fatick region. Our second study allowed us to confirm this evaluation.

Table 1. Farm prevalence in the different regions (* $p < 0.05$).

Regions	Farm prevalence in the sample	Confidence interval for the farm prevalence in the population (risk of error 5%)
Fatick	45.24%	[30.19%-60.29%]
Kolda	31.75%	[20.26%-43.24%]
Ziguinchor*	65.71%	[54.59%-76.83%]

Regarding the individual results, the Ziguinchor region presented a significant higher percentage of seropositives (24.76%) than Kolda (10.85%) and Fatick (13.85%) regions.

Keeping free-ranging pigs, visits of other farmers to the farm and neighbouring ASF outbreaks are the three risk factors which have significant statistical link with the presence or suspicion of ASF in the farms.

Laboratory confirmations of the suspicion in the farms received by farmers represented only 4.3%. The official recorded cases of ASF showed that the date of the last occurrence of the disease occurred in May and June 2005 with two outbreaks in the Ziguinchor region (OIE, 2007). The study of the pig production chain showed that only 5 to 15% of the movement was recorded by the veterinary services and that only 14% of the slaughtering was officially inspected. The assessment of the surveillance network underlined the problem of specific ASF surveillance, such as reporting, sampling, material, financial resources, and global problems of communication, training and feed back of information to the breeders.

DISCUSSION

The blocking Elisa test allowed the detection of anti-ASF virus antibodies. It does not give an annual prevalence but confirms that the animal has been in contact with the virus event if this contact has occurred long time ago (Seifert, 1996). When we compared the prevalence given by the farmer's reports on cases and suspicions with the results of the serologic survey, we observed a general over-estimation of the disease except for the Fatick region. Concerning the region of Ziguinchor farmer's reports are close to the upper limit of the confidence interval of the prevalence but for the Kolda region, there is a real gap between those two prevalences. A majority of breeders (86%) know about ASF. But this knowledge is imperfect because symptoms described are mainly poor general condition and digestive problems and never take into account respiratory problems. This fact could explain the over-estimation of cases. Risk factors such as keeping free ranging pigs and neighbouring ASF outbreaks are well known (>50% of breeders) but visits of other farmers is never perceived as a risk factor. This ignorance and the important ethno-cultural links between breeders in a same village enhance the diffusion of the disease such as described in Ivory Coast and

in Togo (Lefevre, 1998). Two options in the management of the disease could be proposed to improve the current situation of ASF passive surveillance in Senegal. The first one is to develop and involve the local professional organizations (breeder associations) in the surveillance network. The second is to reinforce the information and communication (feedback) between the different actors of the surveillance.

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